COVER SHEET

Culture: A Source for Product Innovation

Richie Moalosi, Vesna Popovic and Anne Hickling-Hudson
Queensland University of Technology

Abstract

There is little in-depth research that can assist designers to use culture as a catalyst for designing innovative products. This paper addresses this gap in the literature by exploring how culture can be used as a source of product innovation within Botswana's context. The concept of culture and design are intertwined, thus modification in the former evolution both reflect and determine developments in the latter. The paper discusses an experimental design approach conducted with design students at the University of Botswana. The approach analysed and identified socio-cultural factors that impact upon design and challenged participants to transform and encode these factors into product design features. The visual and textual data generated by participants was analysed by the qualitative content analysis methodology. The paper concludes by discussing how designers can integrate socio-cultural factors consciously rather than 'incidentally' in order to design innovative and culturally sensitive products.

Keywords: Culture, product design, product innovation, socio-cultural factors, Botswana

Introduction

The relationship between design and culture has taken many twists and turns throughout the last century, as design is seen both as a mirror and an agent of change [Moalosi et al 2005a]. It is observed that modifications in the formers evolution both reflect and determine developments in the latter. For example, one could argue that cultural beliefs and social practices create and reinforce frames of meaning which determine ways of relating to a product. This cultural framing affects people's relative working, the way in which they interpret the product defines the ways in which people use or do not use a particular product.

Cultural rights have been the focus of much debate since the decolonisation movement following World War 2. It is argued that designers should focus on cultural rights [Buchanan 2001]. From a postcolonial perspective, the challenge is to develop ever-increasing respect for cultural rights in the world system, in such a way that the world system itself evolves in accordance with cultures' highest, wisest and most enduring values rather than the basest and crudest practices. In product design, the goal of cultural respect can be achieved by incorporating the historical and aesthetic values of users. This challenges designers to understand what cultural norms and procedures need to be integrated in product design, and how they can be embedded in order to design innovative products [Moalosi et al 2005a]. However, Du Gay et al (2003) acknowledge that cultural factors have been insufficiently recognised in the public debate on how they can contribute to product innovation. Therefore, the paper aims at investigating how culture can be used to generate novel design concepts.

Design and Culture

It is observed that designers need to recognise that people are cultural beings and the process of integrating design and cultural factors in their practice should be emphasised.

Design is firmly embedded in the user's culture: it does not take place in a cultural vacuum [Margolin 2002]. Users are not just physical and biological beings, but socio-cultural beings. There is an argument that designers have not yet been able to easily encode cultural phenomena to the same extent as physical and cognitive phenomena [De Souza & Dejean 1999]. The influence of culture on technological innovation and deployment in a country like Botswana is profound and complex. Innovation and creativity must be assimilated within the context of Botswana's own culture because creativity does not happen in a vacuum, but in the interaction between a user's thoughts and a socio-cultural context. Cultural factors in design do not only strive to make technologies more appropriate for their social context, but also to make better use of culture itself as a resource for innovation [Csikszentmihalyi 1996]. One could argue that consideration of cultural factors might pave the way to the diversification of design concepts, and this would facilitate product innovation. Such product innovation will have been assimilated within the user's socio-cultural context and this might lead to product acceptance and users' satisfaction.

From the above argument, it can be deduced that designers who focus on the intelligence of their users rather than the intelligence of their technology will produce the innovations that really matter. Innovation starts with people, not with enabling technologies, and the designers' main role is to mediate between technology and culture and to add ethics and aesthetics to technology [Szántó 2001]. In this case, designers are agents of cultural change. Product innovation can bring drastic changes of social values, shocks of reorganisation and restructuring, the introduction of new socio-economic restraining mechanisms and shifts in social conditions.

Cultural issues should be integrated in the teaching of science, design and technology. It is important for designers to know how they can easily undermine the indigenous cultural systems of the society. It is through artefacts that cultural values are communicated. Design is therefore, an important medium of communication which expresses the values of the system within which it functions. Moreover, people are not only competent members within their own cultures but they are also interpreters of their own and other cultures.

Most of the current research on the relationship between culture and design is European, American and Asian based and there is relatively little in-depth research on Africa let alone Botswana. Botswana should recognise the rapid international developments in design, science and technology that are re-shaping the societies of the world [Moalosi et al 2004]. While much can be borrowed from other countries, the people of Botswana will need to look within their own resources and culture to find the sources of innovation that will allow them to shape their own future. In this case, the country will need to harness its resources of social and cultural diversity.

Culture might be used as a tool for reflecting users' identities and as a counter balancing force against the neo-liberal form of globalisation which seeks to universalise users' cultures. The next section explores an experimental design approach conducted by one of the authors of this paper with design students at the University of Botswana. The

approach analysed and identified socio-cultural factors that impact upon design, and challenged participants to transform and encode these factors into product design features.

Research method

In 2005, Moalosi conducted a teaching experiment at the University of Botswana with twenty-three fourth year undergraduate design students. This method suits this research because Botswana's socio-cultural factors must be interpreted from the perspective of the participants being studied as Bryman (2001) puts it that the researcher should 'see through the eyes of people being studied.' This helps to probe beneath the surface appearance and provides detailed information about how socio-cultural factors can be transformed into product features. The process enables one to assess how different elements of a social system (values, norms, beliefs, behaviour) interconnect in designing products.

However, participants were introduced to the concept of consciously integrating culture in designing products. Participants were presented with a sample list of socio-cultural factors in Table 1 extracted by using the method of content analysis from Botswana's ancient folktales and other contemporary sources such as the *National Policy on Culture* and national reports on Botswana's culture [Moalosi et al 2005b]. This was done to identify and articulate traditional socio-cultural factors from folktales and contemporary factors from current sources. Traditional factors assist designers to draw on a foundation for extending to new experiences, since the past informs the present and the future. Traditional and contemporary socio-cultural factors were then blended and divided into material, social practices, emotional and technology/design factors (Table 1).

Table 1 – Sample socio-cultural factors

Material Factors	Social Practices	Emotional Factors	Technology/Design Factors
Arts and crafts	Assistance	Beauty	Computing
Baskets	Chieftaincy	Excitement	Electronics
Cattle	Exchange of gifts	Fear	Ergonomics
Indigenous materials	Farming	Friendliness	Hydraulics
Minerals	Music and dance	Frustration	Mechanisms
Ornament	Respect	Happiness	Pneumatics
Thumb piano	Self-reliance	Joy	Product quality
Traditional chair	Sharing	Kindness	Sustainability
Walking stick	Sitting around the fire	Love	Technophobia
Water	Sitting under a tree shade	Satisfaction	
	Social gathering	Stress	
	Storytelling	Thanking	
		Ugly	
		Unpleasant	

Participants were presented with an open design brief which incorporated the factors in Table 1 and their challenge was to transform them into product design features that would

reflect and acknowledge Botswana's culture. However, participants were not limited to using only those socio-cultural factors provided by this method. They were meant for guidance and for example, participants were free to draw on other socio-cultural factors in their design work.

Results and Discussion

This section investigates how socio-cultural factors (Table 1) were used to generate novel design concepts. These factors were incorporated at the early stages of the design process when the concepts were still relatively fluid. Dant (1999) framework on product properties was adapted. The incorporation of socio-cultural factors into product features was in the form of function, signification, gender, knowledge, aesthetics and mediation. It is important to note that the socio-cultural factors in Table 1 might be similar to any other culture but their interpretation within the local context differs. The difference stems from portraying local identities. For example, in Botswana water is a valuable resource to locals because of the semi-arid climatically conditions of the country and it needs to be conserved whilst in other countries it might be of little value.

In generating novel concepts, participants used the bisociative attraction technique. That is, the association of two known ideas which have not been connected previously, for example, connecting music to a traditional shield or canoe. This bisociation of two unrelated ideas collide in a way which jars or surprises users' normal powers of association and gives rise to humour and pleasure. Dorst & Cross (2001) reiterated that the surprising association of an idea drives the originality streak in a design. Hassenzahl (2003) argued that the more unexpected the event is, the more intense will be the pleasure. Pleasure triggers positive emotional reactions such as appealing, attractive, inviting and pleasant to watch and use. This has resulted in seminal innovation which establishes a new visual shape (Jones, 1997).

In Botswana's culture, if one sees a clock which looks like a traditional hut or a thumb piano which looks like a canoe, one might think its fun (Figure 1) connecting with the personal meaning attached to a hut, human face or canoe.

Figure 1 Hut-shape inspired clock

Beauty, fun and pleasure all work together to produce enjoyment and a state of positive affect. Norman (2004) argues that beauty comes from conscious reflection and experience. It is influenced by knowledge, learning and culture.

An emotional factor such as the use of traditional aesthetics (Table 1) created novel concepts. This cultural factor was used in designing novel aesthetic appeal symbolising values and cultural traditions and at the same time fulfilling functional and decorative requirements. The use of local symbols, motifs and patterns has been used as visual clues in creating well defined designs. Participants borrowed from a palette of tried and true historical forms, paradigms, and archetypes which they then tweak with ironic juxtapositions, new materials, subversive details and other internal breaks with tradition and expectation. The aforementioned were also expressed in a personal interview conducted on April 19, 2005 at the University of Botswana that traditional features "…act as a stepping stone to new design ideas."

For example, texture and patterns of the Personal Digital Assistant (PDA) resembles a zebra (Figure 2).

Figure 2 Personal Digital Assistant

Apart from the zebra's beauty, in Botswana, it is the national animal and people accord it some respect. Patterns and texture emphasise the love of natural forms and the *co-existence* of people, land and wildlife (Yang, 2003). This kind of finish breaks the uniform and mechanical mode giving life more interest and recreation. It introduces natural flavour in industrial life, leading users to pay more attention to their co-existence with other species in harmony with the ecosystem. The use of such finish *"…defines true African beauty."* This provides a good example of the role of beauty, order and arrangement in making aesthetic judgement in the local context. The visual and tactile elements of colour, pattern and texture bring gratification to users' experience. *"They compel users' to look and touch and this evoke cultural association."* This aesthetic appeal provides a cultural visual entertainment to users.

The local recognised product features were infused in such a way that Batswana (people of Botswana) will identify themselves with the designed prototypes. This has been illustrated by the participant who designed a PDA (Figure 2). He said, "I have some traditional patterns inspired by a zebra and they are known as *'lekgapho'* which has some aesthetic values of Botswana." In designing products, participants associated them to other activities in the society such as *'lekgapho'* thus the decoration of courtyards. These patterns appeal to users and they make the design appear different and attract attention while having aesthetic appeal and cultural significance. Furthermore, patterns, elegant appearance, form and style arouses emotional and cultural association. In support of the latter, Cross (2002); Stacey et al. (2002) argued that a novel idea should be influenced by the broader culture that defines spaces of acceptable products.

The social environment played a major role in influencing the generation of novel design concepts. Participants looked back to nature to find answers with regard to problems facing the society (personal interviews conducted on April 19, 2005 at the University of Botswana). For example;

> *African design is inspired by the natural surrounding (eco-system) where it is conceived.*
> *Love and the influence of the surrounding (eco-system)…*
> *Designers should consider their environment and culture when they design products for their user.*
> *This is a bed side lamp which has been inspired by a rose.*

Nature possesses a wealth of historical imagery. It introduces an era based on what participants can extract and learn from the natural world. Participants borrowed some forms, shapes, colours and patterns from nature (Figure 3).

Figure 3 Rose inspired bed side lamp

This concept of borrowing from nature has been largely used in the arts and crafts. Features from nature were used for design improvements. Visual and tactile cues emerged from landscapes, animals and vegetation. However, one has to be sensitive to the use of animal figurines as they may carry different connotations to people of different ethnic backgrounds. This participant supported the latter by saying,

> *I thought if I pick a single animal, it could be discriminatory to other ethnic groups. For example, if I had carved the head of a duiker then the walking stick will be relevant to Bangwato only whose totem is phuti.*

Participants have used nature as a source of information and inspiration instead of seeing it as a source of raw materials only. There are clocks which resemble the human face and hut, side lamps which look like roses (Figures 1 and 3). This kind of design inspired by nature;

> *…improves the quality and appearance of the product.*
> *…product becomes more human.*

Design from nature enabled participants to improve the quality of life and at the same time to be conscious about the environment. Charter & Chick (2002) concurred that novel

design concepts should be sustainable. Participants recognised the value of depleted resources or the cost of pollution and diminishing biodiversity. The prototypes designed were mainly made out of appropriate bio-based materials such as wood, leather, horn, and ostrich egg shells, glass reinforced plastics. These materials are biodegradable and there have little impact on pollution and the environment. This point of view is depicted by these participants:

> *…is environmentally friendly as it is a renewable resource and it is biodegradable).*
> *The materials I used are biodegradable.*
> *The product has minimum impact on pollution due to careful material selection.*

In this context, sustainable design moves away from extractive and disposable products that are energy intensive, resource inefficient and toxic towards cyclical, closed-loop products that are restorative, dynamic and flexible. Participants evaluated which raw materials to use prior to selection.

It is worth noting that the majority of the design concepts were incremental innovations. The designs were characterised by gradual changes in the development of an existing idea, such as introduction of new elements or form. Therefore, this makes design ideas appear new, elegant, and different; have a distinct style and image. The newness was not only on physical features but included non-physical features such as generation of new knowledge, signification, mediation and emotional appeal.

There is strong evidence that incorporating socio-cultural factors in design can lead to the generation of novel design concepts. These quotes from participants illustrate their appreciation of this point;

> *These cultural factors can pave the way to the diversification of design ideas that will ultimately lead to product innovation and users satisfaction.*
> *They can eventually give birth to new designs.*
> *Definitely, they can be used to generate new ideas because cultural factors are unique for each society and this can inspire new ways of thinking.*
> *This can be used as a form of inspiration to new design ideas which are related to our culture.*
> *They can, because the ideas you have seen around are similar in a way. If you use cultural factors that have not been applied to products, this would result in unique products.*

Participants in this study confirmed that culture can be used as a new source of innovative design concepts. These findings have implications for design in the sense that socio-cultural factors can be treated as the foundation or springboard for new concepts. This will not only improve the function or appeal of the product but will ground design in the users' culture. Culture-orientated innovation such as this can enable participants to see the world through the eyes of users as argued by Kruger & Cross (2001); Stacey et al (2002).

Conclusion

The approach used for this study gave insights into how Batswana live their lives, their everyday circumstances, their routines, rhythms and their practical concerns. In this context, socio-cultural factors were used as a way of uncovering or at least shedding light on users' social, emotional and aesthetic values and habits. This approach enabled participants to integrate local culture by conscious design effort rather than by accident when designing products. Socio-cultural factors provide an engaging and effective way to open up communication channels and foster an ongoing dialogue with users by involving them in the early stages of the design process. They enabled participants to overcome some of the distance that inevitably exists between designers and users and thereby gather a rich set of materials that grounds design in the lived realities and textures of everyday life. The study suggests that designers would be well advised to treat the use of socio-cultural factors as a spring board to new design concepts. This will not only improve the usefulness, usability and desirability of the products but this will be grounding design in users' culture. The pinnacle of good product innovation is when it is grounded on sensitive cultural analysis of users needs.

References

Bryman, A. (2001) *Social Research Methods,* Oxford: Oxford University Press.

Buchanan, R. (2001) Human Dignity and Human Rights: Thoughts on the principles. *Design Issues,* Vol. 17(3), 35-40.

Charter, M. & Chick, A. (2002) Editorial, *Journal of Sustainable Product Design*, Issue 1, 5-6

Cross, N. (2002) Creative Cognition in Design: Process of Exceptional Designers in Hewett T. & Kavanagh T. (Eds) *Creativity and Cognition*, New York: ACM Press

Csikszentmihalyi, M. (1996) *Creativity: Flow and the Psychology of Discovering and Invention.* New York: Harper Collins.

Dant, T. (1999) *Material Culture in the Social World,* Buckingham: Open University Press.

De Souza, M. & Dejean, P. H. (1999) *Interculturality and Design: Is Culture a Block or Encouragement to Innovation?* Design Cultures – an International conference of Design Research, Sheffield Hallam University, March 30-April 1, 1999.

Dorst, K. & Cross, N. (2001) Creativity in the Design Process: Co-evolution of problem-solution, *Design Studies*, Vol.22, Number 5, 425-437.

Du Gay, P., Hall, S., Janes, L., Mackay, H. & Negus, K. (1997) *Doing Cultural Studies – The Story of the Sony Walkman.* London: SAGE Publications

Hassenzahl, M. (2003) The Thing and I: Understanding the Relationship Between User and Product in Blythe, M. A., Overbeeke, K., Monk, F. A. & Wright, P. C. (Eds) *Funology From Usability to Enjoyment,* London: Kluwer Academic Publishers

Jones, T. (1997) *New Product Development.* Oxford: Butterworth Heinemann

Kruger, C. & Cross, N. (2001) Modelling Cognitive Strategies in Creative Design, in Gero, J & Maher, M. (Eds) *Computational and Cognitive Models of Creative Design V*, University of Sydney.

Margolin, V. (2002) *The Politics of the Artificial*, Chicago: University of Chicago Press.

Moalosi, R., Popovic, V., Hudson, A. & Kumar, K. L. (2005a) Integration of Culture within Botswana Product Design, *International Design Congress Proceedings*, National Yunlin University of Science and Technology, Taiwan.
Moalosi, R., Popovic, V. and Hudson, A. & Kumar K. L. (2005b) Product Analysis in Relation to the Socio-cultural Perspective of Botswana, *International Conference on Design Education Proceedings: Tradition and Modernity*, National Institute of Design - Ahmedabad, India.
Moalosi, R., Popovic, V. and Hudson, A. (2004) Socio-cultural Factors that Impact upon Human-centred Design in Botswana in Redmond, J., Durling, D. and De Bono, A. (Eds). *Futureground Conference Proceedings, Vol. 2,* Monash University, Melbourne, Australia, 162-172.
Norman, D. A. (2004) *Emotional Design: Why we Love (or Hate) Everyday Things*. New York: Basic Books.
Stacey, M., Eckert, C. & Wiley, J. (2002) Expertise and Creativity in Knitwear Design, *International Journal of New Product Development and Innovation Management*, Vol. 4 (1), 49-64
Szántó, B. (2001) The paradigm of globalisation, *Technovation*, Vol. 21, pp. 673-687.
Yang, X. Y. (2003) Culture – Trends for Contemporary Design in the 21st Century, Proceedings of the 6th Asian Design Conference at http://www.idemployee.id.tue.nl/g.w.rauterberg/conference/CD_doNotOpen/ADC/prgram.html (accessed August 21, 2005)

Mr Richie Moalosi (Contact person for any correspondence)
Queensland University of Technology
School of Design
2 George Street, GPO Box 2434
D Block, 304
Brisbane, QLD 4001
Australia
Tel: +617 3864 9183
Fax: +617 3864 8381
Email: r.moalosi@student.qut.edu.au

Affiliation: School of Design, Queensland University of Technology, Brisbane, Australia

Short biography: I'm an Industrial Design lecturer at the University of Botswana (Botswana). I hold a B.Ed. [Design and Technology] from the University of Botswana, MA Design from the University of Wolverhampton (UK) and I'm currently pursuing a PhD at Queensland University of Technology (Australia).

Professor Vesna Popovic
Queensland University of Technology
School of Design
2 George Street, GPO Box 2434
D Block, 523
Brisbane, QLD 4001
Australia
Tel: +617 3864 2669
Fax: +617 3864 1528

Dr Anne Hudson
Queensland University of Technology
School of Cultural and Language Studies in Education
Victoria Park Road
E Block, 424
Kevin Groove Campus
Brisbane, QLD 4059
Australia
Tel: +61 3864 3726
Fax: +61 3864 3988